

10/510912
DT04 Rec'd PCT/PTO 08 OCT 2004

SEQUENCE LISTING

<110> Flores, Osvaldo A.
Grobler, Jay
Murray, Edward M.
Zuck, Paul D.

<120> HEPATITIS C VIRUS ASSAY SYSTEMS

<130> 21080P

<150> PCT/US03/12509

<151> 2003-04-11

<150> 60/372,847

<151> 2002-04-16

<160> 2

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 8732

<212> RNA

<213> Artificial Sequence

<220>

<223> HCV replicon

<400> 1

```

gccagccccc gauugggggc gacacuccac cauagauac uccccuguga ggaacuacug 60
ucuucacgca gaaagcgucu agccauggcg uuaguaugag ugucgugcag ccuccaggac 120
ccccccuccc gggagagcca uaguggucug cggaaccggu gaguacaccg gaauugccag 180
gacgaccggg uccuuucug gaucaaccgg cucaauggccu ggagauuugg gcgugccccc 240
gcgagacugc uagccgagua guguuggguc gcgaaaggcc uugugguacu gccugauagg 300
gugcuugcga gugccccggg aggucucgua gaccgugcac caugagcacg aauccuaaac 360
cucaaagaaa aaccaaaggg cgcgccauc acccagaaaac gcuggugaaa guaaaagaug 420
cugaagauca guugggugca cgaguggguu acaucgaacu ggaucaaac agcgguaaga 480
uccuugagag uuuucgcccc gaagaacguu uuccaauaug gagcacuuu aaaguucugc 540
uauugggcgc gguauuaucc cguauugacg ccgggcaaga gcaacucggu cgccgcauac 600
acuauucuca gaaugacuug guugaguacu caccagucac agaaaagcau cuuacggaug 660
gcaugacagu aagagaauua ugcagugcug ccauaaccau gagugauaac acugcgcca 720
acuuacuucu gacaacgauc ggaggaccga aggagcuaac cgcuuuuuug cacaacaugg 780
gggaucaugu aacucgccuu gaucguuggg aaccggagcu gaaugaagcc auaccaaacg 840
acgagcguga caccacgaug ccuguagcaa uggcaacaac guugcgcaaa cuauuaacug 900
gcgaacuacu uacucuagcu ucccggcaac aaauaauga cuggauggag gcggauaaag 960
uugcaggacc acuucugcgc ucggcccuuc cggcuggcug guuuauugcu gauaaaucug 1020
gagccgguga gcgugggucu cgcgguauc uugcagcacu ggggcccagau gguaagcccu 1080
cccguaucgu aguuaucua acgacgggga gucaggcaac uauuggaugaa cgaaauagac 1140
agaucgcuga gauaggugcc ucacugauua agcauuggua aguuaaaaca gaccacaacg 1200
guuucccucu agcgggauc auuccgcccc ucuccuccc ccccccuua cguuacuggc 1260
cgaagccgcu uggaauaagg ccggugugcg uuugucuua uguuauuuuc caccuauuug 1320
ccgucuuuug gcaaugugag gggccggaac ccuggccugc ucuucugac gagcauuccu 1380
aggggucuuu cccucucgc caaaggaaug caaggucugu ugaauugcgu gaaggaagca 1440
guuccucugg aagcuucug aagacaaaca acgucuguag cgaccuuug caggcagcgg 1500

```

aacccccccac	cuggcgacag	gugccucugc	ggccaaaagc	cacguguaua	agauacaccu	1560
gcaaaggcg	cacaacccca	gugccacguu	gugaguugga	uaguugugga	aagagucaaa	1620
uggcucuccu	caagcguaau	caacaagggg	cugaaggau	cccagaaggu	accccauugu	1680
augggaucug	aucuggggcc	ucggugcaca	ugcuuuacau	guguuuaguc	gagguuaaaa	1740
aacgucuagg	ccccccgaac	cacggggacg	ugguuuuccu	uugaaaaaca	cgauaauacc	1800
auggaccggg	agauggcagc	aucgugcgga	ggcgcgguu	ucguaggucu	gauacucuug	1860
accuugucac	cgcacuaaua	gcuguuccuc	gcuaggcuca	uauggugguu	acaauauuuu	1920
aucaccaggg	ccgaggcaca	cuugcaagug	uggauccccc	cccucaacgu	ucgggggggc	1980
cgcgaugccg	ucauccuccu	cacgugcgcg	auccaccag	agcuauucuu	uaccauacc	2040
aaaaucuugc	ucgccauacu	cgguccacuc	auggugcucc	aggcugguau	aaccaaagug	2100
ccguacuucg	ugcgcgacac	cgggcucuu	cgugcaugca	ugcuggugcg	gaagguugcu	2160
gggggucuu	auguccaaau	ggcucucaug	aaguuggccg	cacugacagg	uacguacguu	2220
uauagcauc	ucacccccacu	gcgggacugg	gcccacgcgg	gccuacgaga	ccuugcggu	2280
gcaguugagc	ccgucgucuu	cucugauaug	gagaccaagg	uuauaccug	gggggcagac	2340
accgcggcg	guggggacau	caucuugggc	cugcccgcuc	ccgcccgcag	ggggaggagg	2400
auacaucugg	gaccggcaga	cagccuugaa	gggcaggggu	ggcgacuccu	cgcgccuauu	2460
acggccuacu	cccaacagac	gcgaggccua	cuuggcugca	ucaucacuag	ccucacaggc	2520
cgggacagga	accaggucga	gggggagguc	caaguggucu	ccaccgcaac	acaauuuu	2580
cuggcgaccu	gcgucaauug	cguguguugg	acugucuauc	auggugccgg	cucaaagacc	2640
cuugccggcc	caaaaggccc	aaucacccaa	auguacacca	auguggacca	ggaccucguc	2700
ggcuggcaag	cgccccccg	ggcgcgucuc	uugacaccuu	gcaccugcgg	cagcucggac	2760
cuuuacuugg	ucacgaggca	ugccgauguc	auuccggugc	gccggcgggg	cgacagcagg	2820
gggagccuac	ucucccccag	gcccgcucuc	uacuugaagg	gcucucggg	cgguccacug	2880
cucugccccu	cggggcacgc	ugugggcauc	uuucgggcug	ccgugugcac	ccgagggguu	2940
gcgaaggcg	uggacuugu	acccgucgag	ucuauggaaa	ccacuaugcg	guccccgguc	3000
uucacggaca	acucgucucc	uccggccgua	ccgcagacau	uccagguggc	ccaucuaac	3060
gccccuacug	guagcggcaa	gagcacuaag	gugccggcug	cguaugcagc	ccaaggguau	3120
aaggugcuug	uccugaaccc	guccgucgcc	gccaccuag	guuucggggc	guauaugucu	3180
aaggcacaug	guaucgaccc	uaacaucaga	accgggguaa	ggaccaucac	cacgggugcc	3240
cccaucacgu	acuccaccua	uggcaaguuu	cuugccgacg	gugguugcuc	ugggggccc	3300
uauagacauca	uaauauguga	ugagugccac	ucaacugacu	cgaccacua	ccugggcauc	3360
ggcacagucc	uggaccaagc	ggagacggcu	ggagcgcgac	ucgucgugcu	cgccaccgcu	3420
acgccuccgg	gaucggucac	cgugccacau	ccaaacaucg	aggagguggc	ucuguccagc	3480
acuggagaaa	uccccuuuu	uggcaaagcc	aucccaucg	agaccaucaa	gggggggagg	3540
caccucauuu	ucugccauuc	caagaagaaa	ugugaugagc	ucgcccgcaa	gcuguccggc	3600
cucggacuca	augcuguagc	auauuaccgg	ggccuugaug	uaucgcugau	accaacuagc	3660
ggagacguca	uugucguagc	aacggacgcu	cuaaugacgg	gcuuuaccgg	cgauuucgac	3720
ucagugaucg	acugcaauac	augugucacc	cagacagucg	acuucagcgc	ggacccgacc	3780
uucaccauug	agacgacgac	cgugccacaa	gacgcggugu	cacgcucgca	gcggcgaggc	3840
aggacuggua	ggggcaggau	gggcauuuac	agguuuguga	cuccaggaga	acggcccucg	3900
ggcauguucg	auuccucggg	ucugugcgag	ugcuauagcg	cgggcugugc	uugguacgag	3960
cucacgccc	ccgagaccuc	aguuaagguu	cgggcuuacc	uaaacacacc	agggguugcc	4020
gucugccagg	accaucugga	guucugggag	agcgucuuu	caggccucac	ccacauagac	4080
gcccuuuucu	ugucccagac	uaagcaggca	ggagacaacu	uccccuaccu	gguagcauac	4140
caggcuacgg	ugugcgccag	ggcucaggcu	ccaccuccau	cgugggacca	aauguggaag	4200
ugucucauac	ggcuaaagcc	uacgcugcac	gggccaacgc	ccugcugua	uaggcuggga	4260
gccguucaaa	acgagguuac	uaccacacac	cccauaacca	aaauacauca	ggcaugcaug	4320
ucggcugacc	uggaggucgu	cacgagcacc	ugggugcugg	uaggcgagau	ccuagcagcu	4380
cuggcccgcu	auugccugac	aacaggcagc	guggucauug	ugggcaggau	caucuugucc	4440
ggaaagccgg	ccaucauucc	cgacagggaa	guccuuuacc	gggaguucga	ugagauggaa	4500
gagugcgccu	cacaccuccc	uuacaucgaa	cagggaugc	agcucgccga	acaauucaa	4560
cagaaggcaa	ucggguugcu	gcaaacagcc	accaagcaag	cggaggcugc	ugcucccgug	4620
guggaaucca	aguggcgggac	ccucgaagcc	uucugggcga	agcauauug	gaauuucauc	4680
agcgggauac	aaauuuuagc	aggcuugucc	acucugccug	gcaaccccg	gauagcauca	4740
cugauggcau	ucacagccuc	uauaccagc	ccgcucacca	cccaacauac	ccuccuguuu	4800

aacaucuccg	ggggaugggu	ggccgccc	cuugcuccuc	ccagcgucg	uucugcuuuc	4860
guaggcgccg	gcaucgcug	agcggcugu	ggcagcauag	gccuugggaa	ggugcuugug	4920
gauauuuugg	cagguuaugg	agcaggggug	gcaggcgcg	ucguggccuu	uaaggucaug	4980
agcggcgaga	ugcccuccac	cgaggaccug	guuaaccuac	ucccugcuau	ccucuccccu	5040
ggcgcccuag	ucgucggggu	cgugugcgca	gcgauacugc	gucggcacgu	gggcccagg	5100
gagggggcug	ugcaguggau	gaaccggcug	auagcguucg	cuucgcgggg	uaaccacguc	5160
ucccccacgc	acuaugugcc	ugagagcgac	gcugcagcac	gugucacuca	gauccucucu	5220
agucuuaacca	ucacucagcu	gcugaagagg	cuucaccagu	ggaucaacga	ggacugcucc	5280
acgccaugcu	ccggcucgug	gcuaagagau	guuugggaa	ggauaugcac	gguguugacu	5340
gauuucaaga	ccuggcucca	guccaagcuc	cugccgcgau	ugccgggagu	ccccuucuu	5400
ucaugucaac	guggguacaa	gggagucug	cggggcgacg	gcaucaugca	aaccaccugc	5460
ccauguggag	cacagaucac	cggacaugug	aaaaacgguu	ccaugaggau	cguggggccu	5520
aggaccugua	guaacacgug	gcauggaaca	uucccauaa	acgcguacac	cacgggcccc	5580
ugcacgccc	ccccggcgcc	aaauuuuuc	agggcgcgug	ggcggguggc	ugcugaggag	5640
uacguggagg	uuacgcgggu	gggggaauuc	cacuacguga	cgggcaugac	cacugacaac	5700
guaaagugcc	cgugucaggu	uccggcccc	gaauucuuca	cagaagugga	uggggugcgg	5760
uugcacaggu	acgcuccagc	gugcaaacc	cuccuacggg	aggaggucac	auuccugguc	5820
gggcucaauc	aaauaccuggu	ugggucacag	cucccaugcg	agcccgaacc	ggacguagca	5880
gugcucacuu	ccaugcucac	cgaccccucc	cacauuacgg	cggagacggc	uaagcguagg	5940
cuggccagg	gaucuccccc	cuccuuggcc	agcuaucag	cuauccagcu	gucugcgccu	6000
uccuugaagg	caacaugcac	uacccgucau	gacucccg	acgcugaccu	caucgaggcc	6060
aaccuccugu	ggcggcagga	gauggggcg	aacauaccc	gcguggaguc	agaaaauaag	6120
guaguaauuu	uggacucuuu	cgagccgcuc	caagcggagg	aggauagag	ggaaguaucc	6180
guuccggcg	agauccugcg	gagguccagg	aaauuccuc	gagcgaugcc	cauaugggca	6240
cgcccggaau	acaaccucc	acuguuagag	uccuggaagg	acccggacua	cgucccucca	6300
gugguacacg	gguguccauu	gccgcccugc	aaggcccuc	cgauaccacc	uccacggagg	6360
aagaggacgg	uuguccuguc	agaauacuacc	gugucuucug	ccuuggcgga	gcucgccaca	6420
aagaccuucg	gcagcuccga	aucgucggcc	gucgacagcg	gcacggcaac	ggccucuccu	6480
gaccagcccu	ccgacgacgg	cgacgcggga	uccgacguug	agucguacuc	cuccaugccc	6540
ccccuugagg	gggagccggg	ggaucccga	cucagcgacg	ggucuugguc	uaccguaagc	6600
gaggaggcua	gugaggacgu	cgucugcugc	ucgauguccu	acacauggac	aggcgccug	6660
aucacgccau	gcgucgcgga	ggaaaccaag	cugcccua	augcacugag	caacucuuug	6720
cuccgucacc	acaacuuggu	cuaugcuaca	acaucucgca	gcgcaagccu	gcggcagaag	6780
aaggucaccu	uugacagacu	gcagguccug	gacgaccacu	accgggacgu	gcucaaggag	6840
augaaggcgga	aggcguccac	aguuaaggcu	aaacuucua	ccguggaggga	agccuguaag	6900
cugacgcccc	cacauucggc	cagaucuaaa	uuuggcuau	gggcaaaggga	cguccggaac	6960
cuauccagca	aggccguuaa	ccacaucgc	uccgugugga	aggacuugcu	ggaagacacu	7020
gagacaccaa	uugacaccac	caucauggca	aaaaaugagg	uuuucugcgu	ccaaccagag	7080
aagguggggc	gcaagccagc	ucgccuuauc	guaucccag	auuugggggu	ucgugugugc	7140
gagaaaaugg	ccuuuacga	uguggucucc	accuccuc	aggccgugau	gggcucuuca	7200
uacggauucc	aaauacucucc	uggacagcgg	gucgaguucc	uggugaaugc	cuggaaagcg	7260
aagaaaugcc	cuaugggcuu	cgcauauag	accgcuguu	uugacucaac	ggucacugag	7320
aaugacaucc	guguugaggga	gucaaucuac	caauguugug	acuuggcccc	cgaagccaga	7380
caggccauaa	ggucgcucac	agagcgccuu	uacaucggg	gccccugac	uaauucuaaa	7440
gggcagaacu	gcggucaucg	ccgugccgc	gcgagcggu	uacugacgac	cagcugcggu	7500
aauaccuica	cauguuacuu	gaaggccgcu	gcgccuguc	gagcugcgaa	gcuccaggac	7560
ugcacgaugc	ucguaugcgg	agacgaccuu	gucguuauc	gugaaagcgc	ggggacccaa	7620
gaggacgagg	cgagccuacg	ggccuucacg	gaggcuaua	cuagauacuc	ugccccccu	7680
ggggacccgc	ccaaaccaga	auacgacuug	gaguugauaa	caucaugcuc	cuccaaugug	7740
ucagucgcgc	acgaugcauc	uggcaaaaagg	guguacuau	ucacccguga	ccccaccacc	7800
ccccuugcgc	gggcugcgug	ggagacagcu	agacacacuc	cagucaauuc	cuggcuaggc	7860
aacaucauca	uguaugcgcc	caccuugugg	gcaaggaua	uccugaugac	ucauuucuu	7920
uccauccuuc	uagcucagga	acaacuugaa	aaagcccuag	auugucagau	cuacggggcc	7980
uguuacucca	uugagccacu	ugaccuaccu	cagaucuu	aacgacucca	uggccuuagc	8040
gcauuuucac	uccauaguua	cucuccaggu	gagaucuaa	ggguggcuu	augccucagg	8100

```

aaacuugggg uaccgcccuu gcgagucugg agacaucggg ccagaagugu ccgcgcuaagg 8160
cuacuguccc aggggggggag ggcugccacu uguggcaagu accucuuaa cugggcagua 8220
aggaccaagc ucaaacucac uccaaucccg gcugcguccc aguuggauuu auccagcugg 8280
uucguugcug guuacagcgg gggagacaua uaucacagcc ugucucgugc ccgaccccg 8340
ugguucaugu ggugccuacu ccuacuuucu guagggguag gcaucuaucu acuccccaau 8400
cgaugaaggu ugggguaaac acuccggccu cuuaggccau uuccucucu uuuuuuuguuu 8460
uuuuggguuu uuuguuuuuu uuucuuuuuu uuuuuuuuuu uuucuuuuuu ccuucuuuccu 8520
uuucucuuiu uuucuuuuuu aaugguggc ccaucuuagc ccuagucacg gcuagcugug 8580
aaagguccgu gagccgcaug acugcagaga gugcugauac uggccucucu gcagaucaug 8640
ugggucggca uggcaucucc accuccucgc gguccgaccu gggcauccga aggaggacgu 8700
cguccacucg gauggcuaag ggagagcucu ag 8732

```

<210> 2

<211> 8085

<212> DNA

<213> Artificial Sequence

<220>

<223> HCV replicon

<400> 2

```

gccagcccc gattgggggc gacactccac catagatcac tcccctgtga ggaactactg 60
tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgctgtgcag cctccaggac 120
ccccctccc gggagagcca tagtggctct cggaaccggg gactacaccg gaattgccag 180
gacgaccggg tcttttcttg gatcaaccgg ctcaatgcct ggagatttgg gcgtgcccc 240
gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg 300
gtgcttgcca gtgccccggg aggtctcgtg gaccgtgcac catgagcacg aatcctaaac 360
ctcaaagaaa aaccaaaggg cgcgccatgc accagaaaac gctggtgaaa gtaaaagatg 420
ctgaagatca gttgggtgca cgagtgggtt acatcgaact ggatctcaac agcggtaaga 480
tccttgagag ttttcgcccc gaagaacgtt ttccaatgat gaggactttt aaagtctctg 540
tatgtggcgc ggtattatcc cgtattgacg ccgggcaaga gcaactcggg cggcgcatat 600
actattctca gaatgacttg gttgagtact caccagtcac agaaaagcat cttacggatg 660
gcatgacagt aagagaatta tgcagtgtcg ccataaccat gaggatgata actgcgccca 720
acttacttct gacaacgata ggaggaccga aggagctaac cgcttttttg cacaacatgg 780
gggatcatgt aactcgcctt gatcgttggg aaccggagct gaatgaagcc ataccaaacg 840
acgagcgtga caccacgatg cctgtagcaa tggcaacaac gttgcgcaaa ctattaactg 900
gcgaactact tactctagct tcccggcaac aattaataga ctggatggag gcgataaag 960
ttgcaggacc acttctgcgc tcggcccttc cggctggctg gtttattgct gataaatctg 1020
gagccggtga gcgtgggtct cgcggtatca ttgcagcact ggggcccagat ggtaagccct 1080
cccgtatcgt agttatctac acgacgggga gtcaggcaac tatggatgaa cgaaatagac 1140
agatcgctga gataggtgcc tctactgatta agcattggta agtttaaaaca gaccacaacg 1200
gtttccctct agcgggatca attccgcccc tctccctccc cccccctaa cgttactggc 1260
cgaagccgct tggataaagg ccggtgtgctg tttgtctata tgttattttc caccatattg 1320
ccgtcttttg gcaatgtgag ggcccggaaa cctggccctg tcttcttgac gagcattcct 1380
aggggtcttt cccctctcgc caaaggaatg caaggtctgt tgaatgtcgt gaaggaagca 1440
gttctctctg aagcttcttg aagacaaaca acgtctgtag cgacccttg caggcagcgg 1500
aacccccac ctggcgacag gtgcctctgc ggccaaaagc cagtggtata agatacacct 1560
gcaaaggcgg cacaaccca gtgccacgtt gtgagttgga tagttgtgga aagagtcaaa 1620
tggtctctct caagcgtatt caacaagggg ctgaaggatg cccagaaggg accccattgt 1680
atgggatctg atctggggcc tcggtgcaca tgctttacat gtgttttagtc gaggttaaaa 1740
aacgtctagg cccccgaac cacggggacg tggttttcct ttgaaaaaca cgataatacc 1800
atggcgcta ttacggccta ctcccaacag acgcgaggcc tacttggtg catcatcact 1860
agcctcacag gccgggacag gaaccaggtc gagggggagg tccaagtgg ctccaccgca 1920
acacaatctt tcttggcgac ctgcgtcaat ggcgtgtgtt ggactgtcta tcatgtggc 1980
ggctcaaaga cccttgccgg cccaaagggc ccaatcacc aaatgtacac caatgtggac 2040

```

```

caggacctcg tcggetggca agcgcccccc ggggcgcggt ccttgacacc atgcacctgc 2100
ggcagctcgg acctttactt ggtcacgagg catgccgatg tcattccggt gcgccggcgg 2160
ggcgacagca gggggagcct actctcccc agggccgtct cctacttgaa gggctcttcg 2220
ggcggtccac tgctctgccc ctcggggcac gctgtgggca tctttcgggc tgccgtgtgc 2280
acccgagggg ttgcgaaggc ggtggacttt gtaccgctcg agtctatgga aaccactatg 2340
cgggtccccg tcttcacgga caactcgtcc cctccggccg taccgcagac attccaggtg 2400
gcccattctac acgcccctac tggtagcggc aagagcacta aggtgccggc tgcgtatgca 2460
gcccgaagggt ataagggtgct tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg 2520
gcgtatatgt ctaaggcaca tggtagcgac cctaaccatca gaaccggggg aaggaccatc 2580
accacgggtg ccccatcac gtactccacc tatggcaagt ttcttgccga cgggtggttc 2640
tctggggggc cctatgacat cataatatgt gatgagtgcc actcaactga ctcgaccact 2700
atcctgggca ctggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg 2760
ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg 2820
gctctgtcca gcaactggaga aatccccctt tatggcaaag ccatccccat cgagaccatc 2880
aaggggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgcgcg 2940
aagctgtccg gcctcggact caatgctgta gcatattacc ggggccttga tgtatccgtc 3000
ataccaacta gcggagacgt cattgtcgtg gcaacggacg ctctaatac gggctttacc 3060
ggcgatttcg actcagtgat cgactgcaat acatgtgtca ccagacagat cgacttcagc 3120
ctggaccaga ccttcaccat tgagacgacg accgtgccac aagacgcggg gtcacgctcg 3180
cagcggcgag gcaggactgg taggggcagg atgggcattt acaggtttgt gactccagga 3240
gaacggccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcggtcgt 3300
gcttggtacg agctcacgcc gcccgagacc tcagttaggt tgcgggctta cctaaacaca 3360
ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc 3420
accacatag acgcccattt cttgtcccag actaagcagg caggagacaa cttcccctac 3480
ctggttagcat accaggctac ggtgtgcgcc agggctcagg ctccacctcc atcgtgggac 3540
caaagtgtga agtgtctcat acggctaaag cctacgctgc acgggccaac gccctgctg 3600
tataggctgg gagccgttca aaacgagggt actaccacac accccataac caaatacatc 3660
atggcatgca tgcgggtga cctggagggt gtcacgagca cctgggtgct ggtaggcgga 3720
gtcctagcag ctctggccgc gtattgcctg acaacaggca gcgtggtcat tgtgggcagg 3780
atcatcttgt ccggaaagcc ggccatcatt cccgacaggg aagtccttta ccgggagttc 3840
gatgagatgg aagagtgcgc ctcacacctc ccttacatcg aacagggaat gcagctgcc 3900
gaacaattca aacagaaggc aatcgggttg ctgcaaacag ccaccaagca agcggagggt 3960
gctgctcccg tgggtggaatc caagtggcgg accctcgaag ccttctgggc gaagcatatg 4020
tggaatttca tcagcgggat acaatattta gcaggcttgt ccactctgcc tggcaacccc 4080
gcgatagcat cactgatggc attcacagcc tctatacca gcccgctcac caccacat 4140
accctcctgt ttaacatcct ggggggatgg gtggccgccc aacttgctcc tcccagcgct 4200
gcttctgctt tcgtaggcgc cggcatcgct ggagcggctg ttggcagcat aggccttggg 4260
aaggtgcttg tggatathtt ggcaggttat ggagcagggg tggcaggcgc gctcgtggcc 4320
tttaaggtea tgagcggcga gatgccctcc accgaggacc tggttaacct actccctgct 4380
atcctctccc ctggcgccct agtcgtcggg gtcgtgtgcg cagcgatact gcgtcggcac 4440
gtgggcccag gggagggggc tgtgcagtgg atgaaccggc tgatagcggt cgcttcgcgg 4500
ggtaaccacg tctccccac gcactatgtg cctgagagcg acgtgcagc acgtgtcact 4560
cagatcctct ctagtcttac catcactcag ctgctgaaga ggcttcacca gtggatcaac 4620
gaggactgct ccacgccatg ctccggctcg tggctaagag atgtttggga ttggatatgc 4680
acggtgttga ctgatttcaa gacctggctc cagtccaagc tcctgcccg 4740
gtccccttct tctcatgtca acgtgggtac aaggagatct gggggggcga cggcatcatg 4800
caaaccacct gcccatgttg agcacagatc accggacatg tgaaaaacgg ttccatgagg 4860
atcgtggggc ctaggacctg tagtaacacg tggcatggaa cattccccat taacgcgtac 4920
accacgggce cctgcacgcc ctccccggcg ccaaattatt ctagggcgct gtggcggtg 4980
gctgctgagg agtacgtgga ggttacgcgg gtgggggatt tccactacgt gacgggcatg 5040
accactgaca acgtaaagtg cccgtgtcag gttccggccc ccgaattctt cacagaagt 5100
gatgggggtg ggttgacag gtacgtcca gcgtgcaaac ccctcctacg ggaggaggtc 5160
acattcctgg tcgggtcaa tcaataacct gttgggtcac agtccccatg cgagcccgaa 5220
ccggacgtag cagtgtcac ttccatgctc accgaccct cccacattac ggcggagacg 5280
gctaagcgta ggctggccag gggatctccc cctccttgg ccagctcatc agctgcccg 5340

```

ctgtctgcgc	cttccttgaa	ggcaacatgc	actaccgctc	atgaactcccc	ggacgctgac	5400
ctcatcgagg	ccaacctcct	gtggcggcag	gagatgggcg	ggaacatcac	ccgcgtggag	5460
tcagaaaata	aggtagtaat	tttggactct	ttcga gccgc	tccaagcggg	ggaggatgag	5520
agggaaagtat	ccgttccggc	ggagatcctg	cggagggtcca	ggaaattccc	tcgagcgatg	5580
cccatatggg	cacgcccggg	ttacaacctt	ccactgttag	agtcctggaa	ggacccggac	5640
tacgtccctc	cagtgggtaca	cgggtgtcca	ttgccgcctg	ccaaggcccc	tccgatacca	5700
cctccacgga	ggaagaggac	ggttgtcctg	tcagaatcta	ccgtgtcttc	tgccttggcg	5760
gagctcgcca	caaagacctt	cggcagctcc	gaatcgtcgg	ccgtcgacag	cggcacggca	5820
acggcctctc	ctgaccagcc	ctccgacgac	ggcgacgcgg	gatccgacgt	tgagtcgtac	5880
tcctccatgc	cccccttga	gggggaaccg	ggggaccccg	atctcagtga	cgggtcttgg	5940
tctaccgtga	gcgaggaagc	tagtgaggat	gtcgtctgct	gctcaatgtc	gtatacatgg	6000
acaggcgctc	tgatcacgcc	atgctgtgct	gaggaaagca	agctgcccac	caacgcgttg	6060
agcaactctt	tgctgcgcca	ccataacatg	gtttatgccg	caacatctcg	cagcgacagg	6120
ctgctgcgga	agaagggtcac	ctttgacaga	ctgcaagtcc	tggacgacca	ctaccgggac	6180
gtgctcaagg	agatgaaggc	gaaggcgctc	acagttaagg	ctaaactcct	atccgtagag	6240
gaagcctgca	agctgacgcc	cccacattcg	gccaaatcca	agtttggcta	tggggcaaag	6300
gacgtccgga	acctatccag	caaggccggt	aaccacatcc	actccgtgtg	gaaggacttg	6360
ctggaagaca	ctgtgacacc	aattgacacc	accatcatgg	caaaaaatga	ggttttctgt	6420
gtccaaccag	agaaaggagg	ccgtaagcca	gcccgcctta	tcgtattccc	agatctggga	6480
gtccgtgtat	gcgagaagat	ggccctctat	gatgtggctc	ccacccttcc	tcaggctcgtg	6540
atgggctcct	catacggatt	ccagtactct	cctgggcagc	gagtcgagtt	cctggtgaat	6600
acctggaaat	caaagaaaaa	ccccatgggc	ttttcatatg	acactcgctg	tttcgactca	6660
acggtcaccg	agaacgacat	ccgtgttagg	gagtcaattt	accaatgttg	tgacttggcc	6720
cccgaagcca	gacaggccat	aaaatcgctc	acagagcggc	tttatatcgg	gggtcctctg	6780
actaattcaa	aagggcagaa	ctgcggttat	cgccggtgcc	gcgcgagcgg	cgtgctgacg	6840
actagctgcg	gtaacaccct	cacatgttac	ttgaaggcct	ctgcagcctg	tcgagctgcg	6900
aagctccagg	actgcacgat	gctcgtgaac	ggagacgacc	ttgtcgttat	ctgtgaaagc	6960
gcggaagccc	aagaggacgc	ggcgagccta	cgagtcttca	cggaggctat	gactaggtac	7020
tctgcccccc	ccggggaccc	gccccaaaca	gaatacgact	tggagctgat	aacatcatgt	7080
tcctccaatg	tgctgggtcg	ccacgatgca	tcaggcaaaa	gggtgtacta	cctcaccctg	7140
gatcccacca	ccccctcg	acgggctg	tgggaaacag	ctagacacac	tccagttaac	7200
tcctggctag	gcaacattat	catgtatg	cccactttgt	gggcaaggat	gattctgatg	7260
actcacttct	tctccatcct	tctagcacag	gagcaacttg	aaaaagccct	ggactgccag	7320
atctacgggg	cctgttactc	cattgagcca	cttgacctac	ctcagatcat	tgaacgactc	7380
catggcctta	gcgcattttc	actccatagt	tactctccag	gtgagatcaa	taggggtggc	7440
tcatgcctca	ggaaacttgg	ggtaccgccc	ttgcgagctt	ggagacaccg	ggcccgggaat	7500
gtccgcgcta	ggcttctgtc	cagaggaggc	agggctgcca	tatgtggcaa	gtacctcttc	7560
aactgggcag	taaggacaaa	gcttaaactc	actccaatag	cggccgctgg	ccggctggac	7620
ttgtccagct	ggttcacggc	tggctacagc	gggggagaca	tttatcacgg	cgtgtctcat	7680
gcccggcccc	gctgggttctg	gttttgctta	ctcctgtctg	ctgcaggaat	aggcatctac	7740
ctcctcccca	atcgatgaag	gttggggtaa	acactccggc	ctcttaggcc	atttcctctc	7800
ttttttttgt	ttttttgggt	ttttttgttt	tttttctttt	tttttttttt	tttttctttt	7860
ttccttcttc	cttttctctt	tttttcttct	ttaatgggtg	ctccatctta	gccctagtca	7920
cggctagctg	tgaaggtcc	gtgagccgca	tgactgcaga	gagtgtgat	actggcctct	7980
ctgcagatca	tgtgggtcgg	catggcatct	ccacctctc	gcggtcggac	ctgggcatcc	8040
gaaggaggac	gtcgtccact	cggatggcta	agggagagct	ctaga		8085